LITERATURE REVIEW

Youth to Youth

A review of peer program theoretical underpinnings, forms, functions, and process- and outcome-related findings

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Wisconsin Department of Public Instruction
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State Superintendent

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Literature Review

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Table of Contents

Section 1:

Introduction

Many of the factors that affect the mortality and morbidity of both teens and adults — such as HIV/AIDS, sexually transmitted diseases (STDs), violence, unintended pregnancy, lung cancer, and others — are associated with a range of risk behaviors which are commonly initiated during adolescence. While many adolescent risk behaviors have declined in the last decade, young people continue to engage in high rates of unprotected sex, drug use, tobacco use, and violent or anti-social behaviors, which not only affect their physical and emotional health and safety, but can also limit life choices and opportunities (see Box 1 for selected findings from the latest Youth Risk Behavior Survey).

Peer-based programs are one strategy commonly believed to have the potential to influence adolescent risk behaviors. These programs use young people to help educate their peers or to act as role models of desired health behaviors. For peer-based interventions, age is often the primary factor in determining what makes a "peer". In addition to age, other factors that may influence who constitutes a "peer" include race/ethnicity, gender, life experiences (e.g., substance abuse), and other characteristics.

While peer-based programs generate both support and enthusiasm, little is known about the actual impact of these programs. Reviews of peer programs consistently lament a lack of well-designed evaluations that can demonstrate the impact of peer programs or the comparative advantage of peer-led versus adult-led programs in reducing behavioral risks (Milburn, 1995; Norman, 1999; Philliber, 1999; and Shiner, 1999). In addition, a clear-cut set of elements that outlines the ingredients of effective peer programs — such as type of recruitment and training, nature of peer involvement, method of program content delivery, funding, and staffing — has not been identified.

The objective of this literature review of is to give readers a concise summary of the diversity found among peer-based approaches, as well as a clear sense of what have been shown, to date, to be effective aspects of peer programs. Given the breadth of peer program topic areas and uses, this review is limited to published evaluations of school- and community-based peer programs that seek to encourage health-related knowledge, attitudes, skills and behaviors regarding smoking, alcohol and drug use, HIV/AIDS/STD, teen pregnancy, and violence prevention among middle- and high-school-aged youth in the United States and Canada.

Box 1: Selected Findings from the Youth Risk Behavior Survey, 1999*

Unintentional and intentional injuries:

- More than one in six students (17.3%) had carried a weapon (e.g., a gun, knife, or club) on one or more of the 30 days preceding the survey. Nationwide, 4.9% of students had carried a gun on one or more of the 30 days preceding the survey.
- More than one-third (35.7%) of students had been in a physical fight one or more times during the 12 months preceding the survey. Four percent (4.0%) of students had been treated by a doctor or nurse for injuries sustained in a physical fight one or more times during the 12 months preceding the survey.
- 5.2% of students had missed one or more days of school during the 30 days preceding the survey because they had felt unsafe at school or when traveling to or from school.

Tobacco use:

- More than two-thirds (70.4%) of students had ever tried cigarette smoking.
- Approximately one third of students (34.8%) had smoked cigarettes on one or more of the 30 days preceding the survey (i.e., current cigarette use). Nationwide, 7.8% of students had used smokeless tobacco (chewing tobacco or snuff) on one or more of the 30 days preceding the survey (i.e., current smokeless tobacco use).

Alcohol and other drug use:

- Many (81.0%) students had had one or more drinks of alcohol during their lifetime.
- Half of all students (50.0%) had had one or more drinks of alcohol on one or more of the 30 days preceding the survey (i.e., current alcohol use)
- Nearly half of all students (47.2%) had used marijuana during their lifetime. About one-fourth (26.7%) had used marijuana one or more times during the 30 days preceding the survey (i.e., current marijuana use).
- Nearly one in ten (9.5%) students had used a form of cocaine during their lifetime. Only 4.0% of students had used a form of cocaine one or more times during the 30 days preceding the survey (i.e., current cocaine use).

Sexual behavior:

- Half of all students (49.9%) had had sexual intercourse during their lifetime.
- 16.2% of all students had had sexual intercourse during their lifetime with four or more sex partners.
- Among currently sexually active students, 58.0% reported that either they or their partner had used a condom during last sexual intercourse. Nearly one-fourth (24.8%) had used alcohol or drugs at last sexual intercourse.
- 6.3% of students reported that they had been pregnant or had gotten someone else pregnant.

*Based on a national sample of 9^{th}-12^{th} graders.
Source: CDC, MMWR, June 9, 2000 / 49(SS05): 1-96.

A number of special populations, such as those with learning disabilities, autism, or attention deficit hyperactivity disorder, have been targeted with peer interventions. These populations, which have a number of unique characteristics, needs, and considerations, are beyond the scope of the review presented here. Peer programs that primarily target academic outcomes — such as increased school attendance, higher academic achievement in particular subjects, or reduced risk of dropping out of school — are also beyond the scope of this review unless they are included as part of a larger health-focused peer-based intervention.

Sections 2, 3, and 4 of this literature review discuss the rationale, types and functions, outcomes, process components, and evaluation methods associated with peer programs. Section 2 summarizes the theoretical underpinnings and rationale for peer programs. It then outlines the forms and functions of peer-based interventions (e.g., peer education and peer mediation) and provides the definitions of terms used throughout this review.

Section 3 focuses on peer program evaluations. It identifies frequently used evaluation methods, outlines the criteria for studies included in the review, and details the outcome and process-related findings of selected peer programs. The section ends with limitations and methodological shortcomings of certain evaluations in an effort to inform more rigorous future research efforts.

Section 4 summarizes lessons learned from the existing research on peer programs and provides recommendations for effective program design and implementation, as well as suggestions for directions and methods for further research. In many cases, evaluations of peer programs have generated more questions than they answered and revealed more about what is *not* known than what *is* known. With regard to peer education programs, a wide range of issues and factors requires further investigation before either confirming or refuting the potential of peer programs to have a positive impact on health risk behaviors among youth.

Section 2:

Theoretical Underpinnings, Rationale, and Forms of Peer Programs

Most people are familiar with the term "peer pressure" — the notion that people, particularly adolescents, are susceptible to the influence of their friends or others like them. Peer pressure can cause them to do things that they otherwise might not do. The aim of peer-based programs is to "tap into what is known about existing social processes and to harness this power…" (Milburn, 1995, p. 408). During adolescence, peers emerge as the most significant social network, supplanting former strong ties to parents, teachers, and other adults (Feldman & Elliot, 1990). As adolescents seek to define their identities, they increasingly turn to and spend time with their peers.

At the most basic level, peer-based programs try to build on the new peer relationships that occur during adolescence and utilize this peer influence for positive ends. This section reviews the theoretical underpinnings and rationale for peer-based programs and then defines the major forms and functions of those programs.

Theoretical Underpinnings and Rationale

"Social learning theories give considerable recognition to the fact that youths gain these understandings and beliefs directly through education and indirectly by observing the behavior of others. In addition, social influence theories address the societal pressures on youths and the importance of helping youths understand and resist those pressures."

~ Kirby, et al. (1994)

Peer-based interventions are said to have a number of advantages when compared to other strategies (Turner & Shepherd, 1999). Peer programs use existing networks of information exchange and dialogue among adolescents. Peer educators are believed to be credible sources of information given their similarity with the target population. In addition, they can act as positive role models, thereby establishing the foundation for desired social norms. Peer educators can also reinforce learning through continued contact and are better able to access hard-to-reach groups. Moreover, they may become empowered themselves by the experience of educating others.

Peer programs are based on a variety of theories — such as social learning theory, social inoculation theory, the theory of reasoned action, diffusion of innovations, and participatory education — that address the ways in which individuals acquire new attitudes and learn new behaviors (a summary of relevant theories is presented in Box 2 below). These theories emphasize three themes:

1) the importance of learning by observing others who are respected by or somehow similar to the observers;

2) the impact of beliefs, attitudes, intentions, self-efficacy, skills, and social norms on the adoption of any given behavior; and

3) the recognition that adolescents themselves can play a useful and vital role in promoting positive behaviors among their peers.

Box 2: Theoretical Basis of Peer-Based Programs

Social Learning Theory (Bandura, 1986)	According to Social Learning Theory, or social cognitive theory, the interpersonal environment influences a person's health behaviors and health outcomes. Social Learning Theory explains human behavior in terms of a three-way reciprocal relationship between behavior, personal factors (e.g., the cognitive, behavioral, and other internal events that affect perceptions and actions), and the external environment. Behavior change is learned either by modeling the behavior of others, through social and self-regulatory skills, or by raising people's beliefs in their capability of change. Central constructs of Social Learning Theory are perceived self-efficacy and social norms. These concepts are particularly relevant for peer programs because "[o]bservational learning is most powerful when the person being observed is powerful, respected, or considered to be like the observer" (Glanz & Rimer, 1997). Peer programs attempt to use peer educators and leaders who are respected by but also similar to the target population. These peer educators can then model desired behaviors; this will demonstrate to others the expected outcomes of the behaviors. They can also lead skill-building exercises, which assist others in developing the capability and self-efficacy to perform the behaviors on their own. Modeling and practice of communication, negotiation and refusal skills are proven methods for enhancing self-efficacy and reducing risk behaviors.
Social Inoculation Theory (McGuire, 1968)	Many health promotion interventions that target adolescents incorporate modeling, role-play, practice and skills-building as essential preventive strategies. The underlying premise of these activities, as posited by Social Inoculation Theory, is that people can more effectively confront the influence of others when they themselves have learned resistance mechanisms beforehand. Interventions that use a social inoculation approach help adolescents prepare and practice counter-arguments in hypothetical situations with the hope that such practice will make it easier for them to resist peer pressure in real-world situations. Peer educators, who are more in touch with the circumstances facing other adolescents and are perceived as insiders, may be especially credible and effective when it comes to helping adolescents develop strategies to counter peer pressure.

Theory of Reasoned Action (Fishbein & Ajzen, 1975)	Behavior change is not a single event; instead, it generally involves a number of intermediate steps. The Theory of Reasoned Action emphasizes the precursors to the adoption of a given behavior — beliefs, attitudes and intentions. Of significance for peer programs is the concept of "beliefs." Beliefs include an individual's "behavioral beliefs" or beliefs toward the behavior itself and also "normative beliefs" which include the individual's perceptions of subjective norms. Normative beliefs concern the degree to which a person feels pressure to act or not act in a certain way; they also concern people's perceptions of which behaviors are typical for others like themselves. In general, people are more likely to have the intention to perform a behavior "when they evaluate it positively and when they believe that important others think they should perform it" (Fishbein, 1979). With this in mind, peer educators can apply positive social pressure to encourage others to behave in ways that promote health. Peer leaders can also help dispel myths about the extent to which teens are actually engaging in risk behaviors and alter norms which contend that "everybody's doing it."
Participatory Education (Freire, 1970; Freire, 1987)	Paulo Freire's ideas about educational reforms in Brazil have been influential in redefining perspectives regarding the nature of education and teacher-student relationships. According to his approach, knowledge that is empowering cannot be delivered in a top-down manner; true learning requires horizontal communication and dialogue among all participants. In this model, rather than being passive recipients of information, those traditionally thought of as "students" become active members in the learning process. The emphasis here is on empowerment, participation, and liberation. One of the unique characteristics of peer programs is their recognition of "young people's skills and abilities and their constructive role in the solution to problems" (Turner, 1999). While there is debate about the degree to which peer programs seek to really empower adolescents (Milburn, 1995), the appeal of these programs is that some adolescents, as peer educators, become engaged in activities designed to improve the lives of other adolescents. Peer educators can benefit by learning new skills (e.g., teaching, problem-solving, communicating, listening); feeling the satisfaction that comes from contributing to one's community; and gaining greater self-efficacy and self-esteem. The target populations also benefit. Peer-to-peer relationships will be less hierarchical than traditional teacher-student relationships and, thereby, allow for interactions among equals. Members of the target population may feel more comfortable discussing issues when the educators are similar to themselves in some ways.

Types of Peer Programs

"One of the main difficulties in assessing and reviewing the field of peer education is reflected in the plethora of terms which are used in the different projects. On an operational level this is highly significant since an important part of clearly delineating work in this area involves deciding which terms, and their implied roles, are appropriate."

~ Milburn, 1995

Peer-led or peer-based interventions encompass an array of programs that utilize a variety of strategies to target a range of populations with a diverse set of goals and objectives in mind. Program planners and theorists refer to these programs using an assortment of more or less defined terms and concepts, many of which overlap with and blend into one another. For example, it may be difficult to fully grasp the nuances between peer education vs. peer teaching, peer support vs. peer counseling, or peer tutoring vs. peer-assisted learning. In practice, these terms may be used interchangeably or particular terms may be chosen on purpose in order to convey subtle differences in philosophies or approaches.

"Peer education" and "peer mediation" are the program types most frequently applied to adolescent health issues and behavior change. The following discussion describes the unique characteristics and uses of these types of peer-based programs.

Peer Education

The term "peer education" can be used to refer to the entire range of peer-based programs or to specify a particular type of intervention. On the one hand, peer education "can most appropriately be viewed as an umbrella term used to describe a range of interventions where the educators and the educated are seen to share something that creates an affinity between them (such as a characteristic like age or an experience like working as a prostitute)" (Shiner, 1999, p. 564). On the other hand, the term can refer to structured programs that emphasize experiential learning among participants, address some aspect of behavior change, and are led by trained peer educators (Norman, 1999). For this review, "peer education" will follow this latter definition. Peer education interventions use trained adolescent peer educators to facilitate encounters that promote health-related knowledge, attitudes, skills, and behaviors among other adolescents.

Peer Mediation

The focus of peer mediation programs is violence prevention and resolution of conflicts within school settings. They are based on principles of negotiation, arbitration and mediation (Rozmus, 1997). In these programs, peer mediators are trained in problem-solving, conflict resolution, and communication and listening skills. Through school-based programs, disputing students may be referred to these trained peer mediators. The peer mediators intervene between individual disputants and attempt to facilitate solutions that are acceptable to both parties. Peer mediation is often used to address less serious interpersonal conflicts before they get out of hand, while conflicts involving serious disciplinary issues or physical altercations may be reserved for school personnel and administrators.

What makes matters confusing is that the term "peer mediation" is sometimes used in conjunction with the term "conflict resolution". "Conflict resolution and peer mediation training" often refers to a particular curriculum that is taught to entire classes or schools (Johnson & Johnson, 1996). When used in this way, peer mediation refers to a type of training that attempts to equip all students with the skills and knowledge to resolve their own conflicts with others in a constructive manner. Since the focus of this literature review is on peer-led interventions, peer mediation should be viewed as a particular type of program that trains certain students as mediators who facilitate solutions to disputes involving other students.

Other Peer-based Interventions

There are four other broad categories of peer-based interventions: peer tutoring, peer leadership, peer counseling and peer support, and peer mentoring. While these programs are not often used — or, at least, evaluated — with regard to health behavior change, it is important to understand the differences and unique characteristics of these programs.

- *Peer Tutoring:* Peer tutoring focuses on the mastery of particular academic subjects. Traditionally, it involves one-on-one relationships where one individual is the tutor and the other is the tutee. Tutors may be older or the same age as the tutees, but they generally possess greater knowledge, ability and skill in the given subject. New models of peer tutoring are placing emphasis on sharing the benefits that result from the experience of being a tutor, such as greater confidence in one's abilities or better understanding of the subject area. These new models are often referred to as "reciprocal peer tutoring" (RPT) or "classwide peer tutoring" (CWPT). Here, participants are of a similar ability and age, and they work in a collaborative manner, alternating taking on the roles of tutor and tutee (Arreaga-Mayer, Terry, & Greenwood, 1998; Fantuzzo & Ginsburg-Block, 1998).

- *Peer Leadership:* Many peer-based interventions, including peer education, can include aspects of peer leadership. Peer leadership involves designating "some adolescents as leaders by nature of their special training or roles" (Philliber, 1999, p. 82). With this approach, some adolescents take on responsibilities and roles that may include serving as advisors, role models, educators, mentors, or counselors for their peers.

- *Peer Counseling and Peer Support:* Peer counseling and peer support — which may take place one-on-one or in groups — involve a certain degree of similarity among all participants in terms of age, status or experiences (Philliber, 1999; Ehly & Vasquez, 1998). In some instances, adolescents are trained in listening and problem-solving techniques, and serve as counselors for their peers. In other instances, peer support groups are created on the basis of shared problems (e.g., drug abuse) or circumstances (e.g., early pregnancy). Peer counseling and peer support program activities center around coping, exploring emotions and feelings, problem-solving, promoting positive outcomes, and building self-esteem and self-efficacy. These peer counseling and support groups may be part of a school-based program or may be offered by community-based organizations that target specific populations.

- *Peer Mentoring:* Peer mentoring refers to an encouraging and supportive relationship between two people. It is often cross-age (the mentor is usually older than the mentored person) and fixed-role (meaning that one individual is always the mentor and the other individual is always the mentored one). This relationship also generally involves "positive role modeling, promoting raised aspirations, positive reinforcement, open-ended counseling, and joint problem-solving" (Topping & Ehly, 1998, p. 9).

Section 3:

Description and Analysis of Peer Program Evaluations

This section explores different types of peer program evaluations and the extent to which peer education and peer mediation programs have been shown to positively impact health-related knowledge, attitudes, skills, and behaviors. It also identifies aspects of program components that have been empirically tested. The section concludes with a discussion of the methodological limitations of the studies.

Types of Peer Program Evaluations

Despite an abundance of peer-based interventions for adolescents, implementation still outpaces evaluation of program impact on reducing adolescents' risk behaviors (Norman, 1998). Among those evaluations that have been carried out, few incorporate rigorous research designs that provide direct evidence of the impact of peer strategies.

In general, evaluations of peer programs are of two different types:

- Impact/outcome evaluation — Assesses whether the peer intervention actually produces the intended effects on knowledge, attitudes, and behaviors (Norman, 1998).

- Process evaluation — Assesses the fidelity and effectiveness of program implementation. May include assessments of whether the program's services fit the goals of the program, whether services reach the intended population, whether services are delivered as intended, the effectiveness of program management, and the use of program resources (Norman, 1998; Rossi et al., 1999). Can either be used as a free-standing evaluation, or in conjunction with impact evaluation to better inform outcomes and modify future implementations.

The strength of impact/outcome evaluation research depends on the research design, the sample size, and the sampling procedures used. Few evaluations of peer programs use sufficiently large sample sizes, random sampling, and random assignment of program participants to intervention groups. It is therefore difficult to confidently conclude that the observed program differences can be attributed to the intervention and not to confounding or extraneous factors.

While this section of the report reviews impact evaluations, process evaluations, and meta-analyses (research that systematically analyzes evaluation findings across a large number of previously published studies) of peer programs that have used fairly rigorous methods, this literature is admittedly limited in terms of the issue areas which are covered, the outcomes which are measured, and the process elements which are evaluated. For example, few evaluations have systematically assessed: the effectiveness of peer-based components of violence prevention programs; the impact of peer-based health interventions on non-health outcomes (e.g., academic achievement); the benefits experienced by peer educators themselves; or the relationship between different program components and program outcomes. In addition, the literature is mainly drawn from academic sources, given that few of the peer-based programs that have been implemented by schools, districts, and states have been evaluated, or evaluated with sufficient rigor to draw accurate conclusions.

Table 1 (Appendix A) presents findings of 14 of the more rigorous impact evaluations found in the published literature. To select the studies, a systematic search of the following electronic databases was conducted for the years 1980 to 2001: MEDLINE, AIDSLINE, ERIC, and PSYCHLIT. The studies were chosen because they meet the following criteria:

- Include a treatment group (e.g., peer-led program) matched with a comparison group;

- Provide at least one follow-up measurement after conclusion of the intervention;

- Focus on the following content areas: Smoking prevention, alcohol and drug use prevention, HIV/AIDS prevention/prevention of risky sexual behaviors, violence prevention;
- Include middle-school to high-school aged youth; and
- Are based in the United States or Canada.

Table 2 (Appendix B) presents the findings of an additional 5 studies that do not meet all of the criteria noted above (e.g., no control group), but do provide important information regarding the impact of peer mediation programs as well as the effect of peer programs on peer educators and peer mediators.

It is important to note that the studies reviewed in this report are illustrative. While they were the only published studies that were found in the electronic database search, they do not necessarily constitute an exhaustive list of the studies that fulfill the selection criteria above.

Findings from Peer Program Evaluations

General Findings

Several reviews have been published which examine the effects of peer-based interventions for young people. Though each review analyzed different interventions, used different methodologies, and drew varying conclusions, the authors, in general, suggest that peer interventions can produce positive outcomes among young people (Philliber, 1999; Black et al., 1998; Mellanby et al., 2000; Tobler, 1986; Tobler, 1992; Posavac & Kattapong, 1999).

Some reviews suggest that peer interventions may even be more effective than adult-led interventions (Philliber, 1999; Mellanby et al. 2000). Mellanby and colleagues (2000), in their review of 13 studies comparing the effects of peers versus adults in delivering similar school-based health education programs, found that peer-led interventions were at least as or more effective than adult-led interventions in changing health-related knowledge, attitudes, and behavior. Philliber (1999), who reviewed ten studies of peer-led interventions, concluded that "peer-led interventions can produce positive outcomes among young people in some behaviors (e.g., substance abuse) that are equal to, and sometimes better than, the outcomes produced by adult leaders, but peer leaders are neither necessary nor sufficient to produce positive outcomes" (p. 99). Other authors' reviews are more skeptical. Posavac & Kattapong (1999), for example, examined the outcomes of 47 peer-based health education programs and found that while these programs are effective overall, for the most part their degrees of impact were not large and called into question "whether these modest effect sizes support the investment of the extra work and expense needed to present health information using peers" (p.1190).

Outcome-related Findings

Substance Abuse Prevention

To date, the majority of peer programs with published evaluations are substance abuse prevention programs. While results of these studies vary, they generally indicate that peer interventions can decrease substance use among young people or alter specific beliefs and attitudes believed to be related to substance use. Some evaluations of substance abuse prevention programs have investigated the effect of peer programs compared to other program strategies (Tobler, 1986; Tobler, 1992). Others investigated which type of program provider delivering the same drug prevention curriculum leads to more positive outcomes (Botvin et al., 1990; Ellickson et al., 1990 and 1993; Murray et al., 1988; Prince, 1995). Findings from these studies are presented below.

Behavioral outcomes

Numerous studies have found that peer-led programs are more effective than other programs in reducing alcohol, drug, or cigarette use among adolescents (Botvin, 1990; Luepker 1983; Murray et al., 1988; Tobler 1986; Tobler 1992). Tobler (1986), for example, in her meta-analysis of 143 adolescent drug prevention programs to assess the

relative success of peer programs compared to other program strategies[1], found that peer programs produced the highest effect sizes for *all* categories of drug use, including alcohol, soft drugs, hard drugs, and cigarette use. Botvin and colleagues (1990) evaluated a 20-session substance abuse prevention program conducted among 1,311 7th grade students. In this study, 10 schools were randomly assigned to peer-led, teacher-led, peer-led with an 8th grade booster session, teacher-led with an 8th grade booster session, or control groups. The authors found that the peer-led booster intervention was generally superior to the other four intervention conditions in reducing smoking, alcohol, and marijuana use.

Other studies found that peer-led and adult-led programs are equally effective in reducing substance use (Ellickson & Bell, 1990; Ellickson et al., 1993; Prince, 1995). For example, Ellickson and colleagues (1990 and 1993) evaluated Project ALERT, a school-based drug prevention program for 7th and 8th graders. In this evaluation, 30 schools in California and Oregon were randomly assigned to the educator, teen, or control groups. Evaluations were conducted with 3,852 students at baseline, 3-month follow-up, before and after a 12-month booster session, and before and after a 15-month booster session. They found that programs led either by adults or those with teen leaders assisting adult teachers both decreased cigarette and marijuana use, yet there were no significant differences in the outcomes produced by either program. Similarly, Prince (1995) in his study of 7th graders from seven Los Angeles and Ventura county schools found that both peer-led and adult-led smoking prevention programs significantly decreased the number of cigarettes smoked daily when compared to the control group.

There is some limited evidence that the positive effects from peer programs can be long-lasting (Murray et al., 1988; Luepker et al., 1983), particularly if the curriculum is repeated over time. Luepker and colleagues (1983), for example, conducted an evaluation of 1,081 7th grade students in Minnesota who participated in a smoking prevention curriculum. For the evaluation, three schools were non-randomly assigned to a control group, a group that provided videotapes and skill-training curricula led by graduate students, and a group where the curriculum was provided by peers. Follow- up measures were taken at baseline and at the end of the 7th, 8th, and 9th grades. While the programs taught by both adults and peers were initially effective in reducing smoking, only the school with the peer-led program continued to have lower smoking rates than the other two schools at the end of the 9th grade. Murray and colleagues (1988) evaluated a smoking prevention curriculum conducted with over 6,000 7th grade students. In this study, four schools were randomly assigned to either peer-led/teacher-facilitated or teacher-led interventions, all of which were conducted with or without the use of a video and were tracked for 4-5 years. The results showed that programs taught jointly by same-age peer leaders and classroom teachers reduced the onset of smoking among non-smokers. After a 5-6 year follow-up, however, there were no longer differences in smoking outcomes among the different intervention groups, which the authors suggest may be due to a lack of booster sessions after the 7th grade (Murray et al., 1989).

Knowledge, attitudes, and belief outcomes

Several studies have shown that peer programs are effective in improving adolescents' knowledge about the prevalence and negative effects of tobacco, alcohol, and marijuana use (Botvin et al., 1990; Tobler, 1986; Tobler, 1992). While knowledge of substance abuse is clearly important for adolescents to identify the dangers of drug use, knowledge in and of itself is not necessarily sufficient to motivate the adoption and maintenance of behavior. Some studies have therefore measured the impact of peer-led substance abuse programs on other cognitive variables that stem from the theoretical underpinnings of peer programs, including behavioral beliefs, locus of control (i.e., the perception that the ability to create change lies in the individual), self-efficacy (i.e., confidence in the individual's ability to create change) or intentions to use drugs. The effect of peer programs on these variables is not clear-cut.

For example, Botvin and colleagues (1990), found that adolescents in the peer-led booster program had significantly higher smoking attitude scores (i.e., had more negative views about the social benefits of smoking) than adolescents in the teacher-led or control groups. In addition, adolescents in the peer-led booster condition had significantly lower (more internal) locus of control scores compared to those in the other conditions. Clarke and colleagues (1986), in an evaluation of peer-led, teacher-led, and expert-led smoking prevention interventions among 7th graders in 10 Vermont schools, found that after an 18-month follow-up both the peer- and teacher-led interventions statistically

[1] Tobler (1986) compared peer programs with the following other program strategies: didactic knowledge only programs; affective programs which make no reference to drugs but aim at producing intrapersonal and social growth; knowledge plus affective programs; and alternative programs which focus on producing opportunities for non-drug leisure activities, or building competence for reading, jobs, or other basic life skills.

reduced the behavioral intention to smoke among females. The rate of daily smoking onset, however, was only reduced among teacher-led female students and not among peer-led students. For male students, none of the treatment interventions were statistically significant. Prince (1995) found that the peer-led smoking prevention program he evaluated had no significant effect on adolescents' smoking refusal self-efficacy measures.

Prevention of Risky Sexual Behaviors

There are far fewer methodologically sound evaluations of peer programs to prevent risky sexual behaviors in the published literature than those to prevent substance abuse. While it is difficult to draw generalizations from a only a few studies, there is limited evidence that peer programs can increase AIDS or pregnancy-prevention knowledge (Kirby et al., 1997; Dunn et al., 1998; O'Hara, 1996; Rickert et al., 1991), change attitudes (Rickert et al., 1991), decrease onset of sexual activity (Sellers et al., 1994), increase condom use (Jemmott et al., 1998), increase intentions to use condoms (Dunn et al., 1998), decrease rates of sexual intercourse (Jemmott et al., 1998), and decrease numbers of sexual partners (Sellers et al., 1994). However, studies also show that even though peer-based programs may have resulted in positive outcomes, they are not necessarily more effective than those implemented by adults in changing knowledge, attitudes, beliefs, and behaviors (Dunn et al., 1998; Jemmott et al., 1998).

Behavioral outcomes

Findings from studies that assess the behavioral impact of HIV/AIDS and pregnancy prevention programs implemented by peer educators are mixed, reporting either no effect on sexual or contraceptive behaviors (Kirby et al., 1997) or significant positive behavioral changes (Jemmott et al., 1998; Sellers et al., 1994). Kirby and colleagues (1997) conducted an evaluation of Project SNAPP, an interactive AIDS and pregnancy prevention program implemented by peers in six Los Angeles middle schools. Nearly all of the 102 classrooms within the schools were randomly assigned either to the treatment group, which received SNAPP, or to a control group which did not receive the SNAPP curriculum. Measures of program impact were taken before the implementation and at 5- and 17- month follow-ups. Analyses of the data revealed that there were no significant differences between the SNAPP and control groups in the proportions of students who initiated sexual intercourse, the numbers of times they had sex, the number of sexual partners they had, or the frequency with which they used condoms or birth control pills.

Sellers et al., 1994 evaluated a condom availability and education program for 586 Latino youth conducted by peer leaders. Evaluation of the intervention consisted of a longitudinal comparison of probability samples of Latino youth from the intervention city (Boston) and a comparison city (Hartford, Conn.). Study findings showed that males in the intervention city were less likely than those in the comparison city to initiate first sexual activity. In addition, female respondents in the intervention city were less likely to have multiple partners. The program had no effect on the onset of sexual activity for females, the likelihood of multiple partners for males, or the frequency of sex for males or females.

One study in the published literature assessed sex-related behavioral outcomes when peers versus adults delivered similar interventions, demonstrating that peers and adults seem equally effective in reducing risky sexual behaviors (Jemmott et al., 1998). In one of the only large-scale randomized controlled trials on this subject, Jemmott and colleagues (1998) randomly assigned 659 African American 6th and 7th graders to one of six intervention groups: abstinence interventions led by an adult, or by a peer; safer-sex interventions led by an adult, or by a peer; and a "control" intervention led either by an adult or a peer that focused on health promotion but not AIDS or sexual behavior. Each intervention consisted 8 hours of interactive, skill-building sessions, divided equally over two Saturdays. Measurements were taken immediately after the intervention, and at 3-, 6-, and 12-month follow-ups. Results from the study showed that peer-led and adult-led interventions were equally effective in increasing condom use and decreasing rates of sexual intercourse and that many of these behavioral effects held for a year after the intervention.

Knowledge, attitudes, and belief outcomes

Evaluations of peer HIV/AIDS or pregnancy prevention programs provide evidence that they have increased knowledge; however, the impact of these programs on other cognitive variables — particularly over the long term — is less clear. Kirby and colleagues (1997) found that while Project SNAPP had no significant effect on behavioral, attitudinal, or belief outcomes, it did increase knowledge about HIV- and pregnancy-related topics, and this increase endured for at least 17 months. Other studies have found that peer programs increased adolescents'

knowledge about HIV risk or pregnancy prevention, provided positive attitudes toward practicing preventive behaviors, enhanced prevention-related beliefs or self-efficacy, and increased adolescents' intentions to use condoms yet have shown no difference in effectiveness between peer-led and adult-led programs (Dunn et al., 1998; Jemmott et al., 1998; Rickert et al., 1991). Jemmott and colleagues (1998), for example, found that both peer- and adult-implemented programs resulted in stronger beliefs concerning the value of abstinence, weaker intentions to have sex, more positive beliefs about condoms, and greater self-efficacy for using condoms immediate post-intervention. However, these effects were not evaluated over time. No significant differences were found between the treatment and control groups in technical skills belief, negotiation skills belief, or condom-use intentions.

Violence Prevention

While the use of conflict resolution curricula and peer mediation programs are common violence prevention strategies in schools, few published studies have rigorously evaluated the peer-led or peer-based components of these programs (Rozmus, 1997). Peer-led interventions are sometimes part of more comprehensive, multi-component violence prevention projects, thereby making it difficult to isolate the impact of any one component (Kelder et al., 1996). Measures of success of peer-led violence prevention programs are often based on testimonials and anecdotal or subjective accounts rather than rigorous methods (Rozmus, 1997; Drug Strategies, 1998). In such cases, teachers and administrators have reported perceived declines in fighting and other discipline problems as well as improved school climates; they have also noted the benefits of teaching students to take responsibility for their own actions (Burrell & Vogl, 1990; Lindsay, 1998).

Johnson & Johnson (1996) reviewed of a range of studies (published and unpublished) regarding both conflict resolution training and peer mediation. While many of the studies suffered from methodological limitations, including reliance on anecdotal data and a lack of clear definitions of dependent variables such as "fight" or "discipline problem", they suggest that conflict resolution and peer mediation programs "do decrease discipline problems, violence, referrals, detentions, and suspensions" (p. 493) and that comprehensive violence prevention strategies can improve academic achievement and school climate.

Behavioral outcomes

Peer-based violence prevention programs utilize two main strategies: they use peer educators to teach fellow students conflict resolution skills or they train certain students to act as peer mediators between disputing students. Only one study of a violence prevention program using peer educators was found that incorporated a fairly rigorous design (Orpinas et al., 1995). Therefore, drawing conclusions about the impact of such programs on adolescent behavior is difficult. Orpinas and colleagues (1995) studied the impact of a violence prevention curriculum on 223 6th graders in four middle schools. In two schools, one class each was assigned to a teacher-led, teacher-led assisted by peer leaders, or control group. In the other two schools, one class was assigned to a teacher-led curriculum and the other to a control group. Surveys were administered one week before and after the four-unit intervention, as well as at 3-month follow-up. While the results showed that boys in all six intervention classes reported reduced aggressive behavior, this reduction was significant in only one out of two teacher-plus-peer-leader classes and one out of four teacher-only classes. Girls reported decreases in aggressive behavior in four intervention classes and increases in two intervention classes, though none of these changes were significant. These reductions were not maintained at 3-month follow-up.

Three studies have attempted to use more rigorous methods to assess the impact of peer mediation programs (Tolson, McDonald, & Moriarity, 1992; Crary, 1992; Bell, Coleman, Anderson, Whelan, & Wilder, 2000). Tolson and colleagues (1992) evaluated a peer mediation program in a suburban high school by comparing outcomes for students randomly assigned to either peer mediation (n=28) or traditional disciplinary strategies (n=24), such as warnings, suspensions and demerits. Researchers tracked the number of times students were referred for interpersonal problems and other disciplinary problems during the 49-day period following peer mediation and traditional discipline. Peer mediation reduced the number of referrals for interpersonal conflicts, but did not change the total number of disciplinary referrals. At one-week follow-up meetings, most disputants reported that they and other disputants complied with the resolutions.

Crary (1992) analyzed a peer mediation program for urban middle school students by collecting data from student disputants, student mediators, students at large, and faculty and staff members. Over a one-year period, 96 cases involving 203 students were referred to peer mediation; 95 cases agreed to mediation with resolutions of disputes

being reached in 97% of the cases. A follow-up at the end of the school year with 80 disputants showed that nearly all of the mediated disputes remained resolved. Toward the end of the study period, teacher/administrator referrals to mediation decreased and self-referrals to mediation increased. The authors suggest that these data support the notion that students became more aware of the program as an effective alternative for dealing with interpersonal conflicts.

In a study of 6th-8th grade students from a rural, low-SES elementary school, Bell and colleagues (2000) evaluated a peer mediation program by tracking mediation outcomes and by comparing suspensions from the intervention year with three previous years of data. Thirty students were trained as peer mediators. By the time of the six-week follow-up, 34 mediations had been conducted, of which 94% were successfully mediated and 6% were referred to the principal. While suspensions as a percentage of the total enrollment had been declining in the three previous years, the largest decline was noted during the intervention year. In particular, suspensions for immoral behavior and for disruptive conduct exhibited sharp declines, while suspensions for fighting decreased by only a modest amount.

Knowledge, attitude, and belief outcomes

In evaluating the violence prevention curriculum, Orpinas and colleagues (1995) found that both teacher-led and teacher-plus-peer-leader interventions significantly increased knowledge about violence and skills to reduce violence. Both of the teacher-plus-peer-leader classes also showed significant changes in attitudes toward responding with aggression when provoked. However, these changes were not maintained over time. Neither intervention had a significant effect on self-efficacy for nonviolently expressing emotions or for resisting the pressure to fight.

Peer mediation program evaluations have considered satisfaction with the peer mediation process, as well as perceptions regarding school climate. Conducting surveys one-week after peer mediation sessions, Tolson and colleagues (1992) found that most of the 28 disputants gave peer mediation "high" ratings for usefulness, fairness, and the peer mediator's skill in mediation. Similarly, in Crary's (1992) study of peer mediation in an urban middle school, student disputants reported that the mediation process was fair, effective and worthy of being repeated or recommended to other students. Pre- and post-intervention survey data from a random sample of 125 students showed some overall improvements, but no statistically significant differences, in student perceptions of school climate. Three school climate items – "students can make a difference," "teachers respect students' culture," and "rules and expectations clearly defined" – showed statistically significant changes in a negative direction, demonstrating less agreement with these statements during the intervention year. On the other hand, survey responses of faculty and staff (n=23) were statistically significant on a number of items and showed improvements in perceptions of school climate. As part of their study of a peer mediation program for 6th-8th graders, Bell and colleagues (2000) surveyed a sample of 25 teachers regarding school climate. They found that teachers reported reductions in in-class fights following implementation of a peer mediation program, though these differences were not statistically significant between the pre-test and 12-week follow-up.

Effect on Peer Leaders

One of the justifications for implementing peer programs is that these programs not only benefit the target students, but they also have a positive impact on the peer educators and peer mediators themselves (Philliber, 1999). In theory, these trained peers gain knowledge in the particular content area, as well as greater self-esteem and improved interpersonal skills by acting as educators and mediators. While anecdotal and testimonial data suggest positive outcomes for personal development (Backett-Milburn & Wilson, 2000; Casella, 2000), few studies have rigorously evaluated the actual impact of peer programs on middle and high school students who serve as peer educators and peer mediators.

Behavioral Outcomes

Evaluations that consider the effect of training and program participation on peer educators have shown that these programs can impact peer educator behavior. Haignere, Freudenberg, Silver, Maslanka, & Kelley (1997) studied the impact of HIV/AIDS prevention training on 35 peer educators from middle and high schools. Between pre-test and 4- to 6-month follow-up, peer educators reported having discussions with more people, giving more presentations, distributing condoms to more people, and speaking up more when others said something negative about persons living with HIV/AIDS.

Birnbaum, Lytle, Story, Perry, & Murray (In press) considered the impact of a nutrition program on the behavior of 226 7th grade peer leaders. For the study, 16 schools were randomly assigned to the control group (n=8) or one of the following conditions: 1) school environment intervention only; 2) school environment intervention plus classroom instruction; or 3) peer leaders who received training and led nutrition-related activities as well as received classroom and school environment interventions. The study found that peer educators, at the end of the school year, demonstrated the most significant behavior changes in terms of self-reported consumption of fruits and vegetables and selection of lower-fat foods.

Knowledge, attitudes, and belief outcomes

Haignere and colleagues (1997) found that peer educators receiving HIV/AIDS prevention training reported significant increases in knowledge, self-efficacy and resistance to peer pressure at 4- to 6-month follow-up. With regard to peer mediation, Crary (1992) found that pre- and post-tests of 53 peer mediators before and after training showed trends toward improved self-concept and self-esteem, though these trends were not statistically significant. The author suggests that these changes may have been more significant if surveys were given after actual mediation sessions, rather than just after the training period. Bell and colleagues (2000) assessed mediation skills retention by surveying 30 peer mediators before and after training and at six-week follow-up. When asked to give written responses to hypothetical conflict situations, peer mediators at both post-test and follow-up noted implementing more of the steps of mediation to resolve the conflicts than they had noted prior to training. While a nutrition intervention did impact peer educator eating behavior, Birnbaum and colleagues (In press) did not find any significant changes in the psychosocial factors believed to influence eating behavior (e.g., intentions, outcome expectations, barriers to healthy eating).

Process-related Findings

Recent reviews of programs addressing adolescent risk behaviors have identified broad components shared by effective interventions (Kirby, 1999; Eisen et al., 2000; Janz et al., 1996; Tobler, 1992). The most effective programs have a theoretical grounding in social learning or social influence theories which are built on the assumption that behavior is changed by altering potential risk-producing situations and social relationships, risk perceptions, attitudes, self-efficacy beliefs, intentions, and outcome expectations. Programs should be provided in a non-didactic manner, employing interactive health and communication strategies such as modeling and practice of communication, negotiation, and refusal skills. Instructors can best reach students through active learning methods, including small group discussions, games or simulations, and role-playing. In addition, curricula that include data indicating the number of youth actually engaged in risk behaviors have proven especially effective in influencing peer normative beliefs.

These general characteristics can provide the basis for thinking about the necessary elements of effective peer programs. In addition — though scarce — research from studies that have empirically assessed the qualities of peer programs, peer educators, and/or settings are beginning to point to particular components of effective programs. These qualities are described below:

- *Programs include yearly booster sessions*

Numerous evaluations of peer programs suggest that booster programs are important for maintaining and strengthening early program results (Botvin et al., 1990; Ellickson & Bell, 1990; Murray et al., 1988; Murray et al., 1989; Orpinas et al., 1995). Botvin and colleagues (1990), for example found that the 7th grade peer-led interventions with booster sessions provided in the 8th grade were more effective than non-booster peer-led interventions in reducing tobacco, alcohol, and marijuana use. Similarly, Ellickson & Bell (1990) note that Project ALERT's booster sessions applied at 12- and 15- month follow-ups of the 7th grade drug prevention curriculum "appeared to provide the reinforcement needed for the emergence of significant smoking reductions and to prevent the erosion of seventh-grade program effects for marijuana" (p.1304). Murray and colleagues (1988, 1989) attribute the lack of significant reductions in smoking in their 5-6 year follow-up of young people enrolled in a 7th grade smoking prevention curriculum, as compared to the 4-5 year follow-up, in part, to the fact that no booster sessions were applied.

- *Programs are provided school-wide*

Orpinas and colleagues (1995) in their evaluation of a violence prevention curriculum among 6th graders found that the highest reductions in aggressive behavior were found in schools where more than one class was receiving the curriculum. The authors suggest that "Since students in middle school are not self-contained and do interact with other students, it is possible that having more students being taught the curriculum could help reinforce nonviolent behaviors" (p. 369).

- *Curriculum is provided through developmentally appropriate interactive teaching provided in small group settings*

Several evaluations of peer education programs reported interactive teaching tends to be most effective in influencing risk-related outcomes. Black and colleagues (1998), for example, in a meta-analysis of 120 adolescent drug prevention programs compared interactive peer programs to non-interactive programs delivered by teachers or researchers and found the interactive peer programs to be statistically more efficacious in preventing drug use among adolescents. Interactive programs focused on building interpersonal competence and knowledge about short- and long-term consequences of drug and pro-drug influences, building skills and confidence in drug refusal under conditions that can be transferred and used in real life situations, and dispelling the myth that everyone is using drugs by including relevant statistics. Moreover, small group instruction was important along with constructive feedback to improve refusal skills. Similar findings were cited in Tobler's (1992) meta-analysis of drug prevention programs which demonstrated that peer programs which focused on interaction and skill-building, were much more effective in lowering drug use than knowledge-only, knowledge-plus-affective, and alternative programs. In addition, the author found that successful prevention efforts were developmentally timed. Most effective in the 6th-8th grades were programs that stressed the acquisition of skills. For high school aged youth, the important core processes were interactions to share ideas, feelings, and experiences about drugs.

- *Interventions include a skilled leader, competent in group processes*

Tobler's (1992) research results found peer programs that were most effective include a skilled leader (either adult or peer), competent in group processes, who enhanced the interactional process and simultaneously focused and directed the group. In particular, "successful leaders of adolescent groups have the ability to act as guides, as opposed to being dominant. They are able to tolerate ambivalence, and know when to remain silent to facilitate true dialogue. They are able to empower adolescents to make conscientious decisions and to encourage freedom of choice and individual self-determination" (p. 21). Furthermore, research results from her meta-analysis showed that mental health professionals/counselors could facilitate substance abuse prevention programs more effectively than teachers could, due to their training and/or experience in running groups. Peers, however, were more effective leaders than teachers were, as well, probably due to the fact that they received more training in leading programs.

- *Interventions are provided in an organized setting*

In examining the effect of classroom environments on AIDS-related knowledge and attitudes, Ozer and colleagues (1997) found that greater improvements in AIDS-related knowledge and attitudes were found among participants who perceived their intervention classes to be organized (e.g., participants responded to peer educators' requests; did not shout; did not sit on their desks) as compared to those that were found to be less organized.

Peer educator characteristics such as sociability and confidence may be important to achieve positive program results

It is commonly believed that matching peers and program participants on the basis of ethnicity, gender, and age may enhance the effects of interventions. While evaluations assessing the effects of background characteristics of peer educators on program outcomes are limited, some evidence substantiates that certain personality characteristics of peer educators may be important in positively influencing outcomes. For example, Ozer and colleagues (1997) investigated the qualities of peer educators that were significantly associated with post-intervention AIDS-related attitudes among 123 ethnically diverse 7th graders. They found that while participants' ethnic match and perceived similarity were not significantly associated with improvements in AIDS-related knowledge or attitudes, participants' positive regard for peer educators was. Participants expressed greater positive regard for less shy and more individuated (e.g., more willing to speak up for themselves) peer educators and these qualities were in turn

associated with lowered AIDS risk as measured by perceptions of peer norms regarding sexual activity and self-efficacy for peer communication regarding sexual topics and condoms. The author's note that less shy and more individuated peer educators tended to personalize the curriculum more, whereas the more shy and less individuated ones read directly from the curriculum and provided a less interesting delivery.

Limitations of Peer Program Evaluations

This review draws information from the published literature in an effort to most credibly explore the efficacy of peer programs. While many different peer-based or peer-led strategies have been implemented across the country, rigorously evaluated peer programs are lacking in the published literature. Much of what is written about peer programs relies on testimonials and anecdotal data, which may provide important insights but do not necessarily prove the impact of peer programs. Unfortunately, those studies that do document the effect of peer programs rarely assess the different components — such as training, program content, characteristics of the peer educators, the role of the program coordinator — which made the program a success. Therefore, little empirical knowledge exists about the relationship between program elements and program outcomes.

In addition, the types of outcomes that are evaluated are limited. For example, while the benefits experienced by the peer educators themselves is a justification for peer programs, few studies have tried to systematically measure the impact of these programs on middle and high school peer educators. Also, while health behavior has been linked to academic achievement and self-esteem, few of the peer-based health intervention evaluations have considered the impact of the health intervention on academic or social indicators. Another limitation is that few evaluations have specifically evaluated the peer component of comprehensive violence prevention programs.

While this report described some of the more rigorous evaluations of peer programs found in the literature, numerous methodological problems within these evaluations reduce confidence in the outcomes of these studies. Given the practical challenges in conducting solid evaluation research, a bias exists in the types of programs that have been evaluated. Those programs that have been evaluated are often carried out as part of a short-term research project rather than as part of an existing ongoing school- or community-based program. In addition, very few of the evaluations assessed the impact of peer interventions delivered over several years. Thus, even though most of the studies showed that peer programs can be effective in changing adolescents' risk-related knowledge, attitudes, and behaviors, it is still not clear whether these results can be maintained over time in a practical setting.

Other limitations of the evaluations reviewed in this report should be considered as well. First, several of the evaluations included small sample sizes that did not provide sufficient statistical power to draw accurate conclusions. Several of the studies did not randomly assign participants to treatment conditions or use equivalent curricula or activities in all conditions. Second, many studies included primarily white, heterosexual, middle-class students. It is therefore difficult to generalize the outcomes to other populations. Third, the evaluations, in general, relied on self-reported information. Gathering reliable information on sensitive topics can be difficult, especially in the adolescent population. For surveys assessing sexual behavior, for example, respondents often over or under report behaviors depending on whether that behavior has a positive or negative social value (Catania, Gibson, Chitwood, and Coates, 1990). In sex surveys conducted with adolescents, response biases were associated with the sensitivity of the questions asked, respondents' levels of sexual experience, gender, ethnicity, and sexual orientation (Catania, McDermott, and Pollack, 1986; Ford and Norris, 1991; Rogers, Billy, and Udry, 1982). While substance abuse researchers can easily validate self-reported data by collecting saliva samples, only a few studies actually incorporated this procedure into their design.

Finally, many of the outcome indicators used in the studies were limited to knowledge and behavioral outcomes — few evaluations study intermediate outcomes thought to influence the health-related risk behaviors (see Section 2). Assessing intermediate results of the programs was difficult. Among those outcome measures that were used, it was difficult to compare findings across studies in a systematic way since each study within a certain topic area used different measures of the dependent variables. In addition, many studies used measures of dependent variables with low or unknown reliability and validity. A set of reliable and valid measures of dependent variables needs to be developed and utilized so that results of studies can be compared.

Section 4:

Conclusions and Recommendations

The review of published peer program evaluations shows some evidence that peer-led education can be an effective strategy for reducing certain risky health-related behaviors among adolescents. In particular, peer-led interventions are effective in reducing alcohol, drug, or cigarette use among youth and, in several studies, were even more effective than interventions led by adults. While there is less empirical evidence of the benefits of the peer approach for preventing HIV/STDs, pregnancy, and violent behaviors, existing data provide some degree of support for the usefulness of peer educators in increasing positive health-related outcomes. Peer programs have also been shown to have a positive impact on the peer educators themselves, increasing their knowledge and self-efficacy, as well as influencing health risk behaviors.

Unfortunately, there is insufficient evidence regarding exactly how peer educators can be most effective in producing positive outcomes among young people. Only three of the twelve studies which tested the relative value of peers versus adults in producing various health-related outcomes — and were sufficiently "rigorous" to be included in this report — demonstrated that the same program implemented by peers was more advantageous than that implemented by adults (Botvin, et al., 1990; Luepker et al., 1983; Murray et al., 1988). The other studies, for the most part, showed that peer-implemented programs were as effective as adult-implemented programs. Most of the studies did not examine the difference between educational approaches and the person delivering those approaches in relation to outcomes. In addition, because the populations, the interventions, the role of peers, and their training varied substantially among the studies reviewed, definite recommendations cannot be made as to whether future programs should be implemented solely by peers or by both adults and peers, or what pieces of the program would be more appropriately delivered by whom. It is also important to keep in mind that peer programs do not exist in a vacuum. The success of any intervention aimed at youth — peer-based or otherwise — will be influenced by a number of outside factors, including environmental circumstances (e.g., school, community, and family factors) and individual characteristics of both the peers and the peer educators themselves. What can be concluded from the research gathered so far is that while peer programs may not be *the* solution to preventing young people's risk-taking behaviors, peers can have a valuable role.

The next section provides a list of recommendations and considerations for those interested in implementing and evaluating peer programs. To advance the field of peer-based interventions and to provide possible future evidence for the efficacy of this approach, programs must be well designed, implemented, and evaluated. The recommendations provided below are based both on the empirical evidence gathered so far of successful peer programs and from guidelines suggested by program planners, theorists and organizations experienced with peer-based interventions.

Recommendations for Designing and Implementing Peer Programs

Findings from Evaluated Peer Programs

Peer programs should:

- Be based on a solid foundation in social learning and social influence theories that address how learning and behavior change occur on the individual level and within social networks;
- Use interactive, developmentally appropriate teaching methods that emphasize experiential learning rather than the presentation of information only in a didactic manner;
- Utilize class-sizes that are conducive to small-group instruction;

- Use booster sessions to update and reinforce original program content;
- Be provided to more than one class;
- Be well organized and be conducted in an organized manner;
- Be implemented by peers who present the curriculum in an interesting, dynamic manner; and
- Be delivered by a skilled adult or peer leader, competent in group processes.

Recommendations from Implementers Experienced with Peer-based Interventions

- *Clearly define the target population, in terms of age, ethnicity/race, gender, sexual orientation, socio-economic status, and life experiences, and select peer educators and peer leaders accordingly.* To take full advantage of peer approaches, project planners should carefully consider the characteristics of their target populations and the characteristics and personalities of potential peer educators to reach specific populations. When determining what makes a peer, age is often the primary factor. Many factors, including ethnicity, class, culture, life experiences, and personality, influence our identities, as well as who we perceive as being our peers (Shiner, 1999). In addition, while conclusive evidence about the impact of peer programs on males versus females does not yet exist, factors such as peer and participant gender should be taken into consideration when planning a program. Peer educators can be recruited or selected in a number of ways, and the methods for recruitment will impact the type of adolescents who serve in the program. In school-based programs, peer educators may volunteer for the position, be nominated by teachers or other school personnel, or may be voted on by their fellow peers. Project coordinators of community-based programs may have volunteers or they may actively reach out to and recruit from the populations they serve. The key is to consider the appropriate fit between program objectives, peer educators, and target populations.

- *Articulate program philosophies, goals, and objectives, and use these priorities to guide program design.* Program philosophy will determine the method of program delivery and implementation. Norman (1999) notes that the same goals and objectives can be reached by a variety of methods. For example, to reduce sexual risk behaviors, one-on-one peer counseling or formal peer education sessions may be used. Alternatively, program planners may institute a peer tutoring program that aims at academic achievement and self-esteem with the hope that this will indirectly impact sexual behavior. Objectives will also affect the selection of peer educators. For example, programs that focus on the prevention of risk behaviors or the maintenance of healthy behaviors may select adolescents who can serve as positive role models for their peers. Programs that focus on treatment or changing unhealthy behaviors, on the other hand, may recruit adolescents who themselves have engaged in risk behaviors. These peer educators may be more credible when discussing the negative consequences of such behaviors. When it comes to outreach work, they might also have greater access to at-risk or hard-to-reach populations. Again, the key is the appropriate fit between guiding principles, goals, target populations, peer educators and delivery methods.

- *Determine the roles and responsibilities of peer educators.* These decisions will center on the degree to which peer educators are involved in planning and decision-making; the role of peer educators in program delivery and implementation; and the extent to which concepts such as peer empowerment and personal growth are goals of the program. For example, interventions may take an approach that emphasizes "peer delivery" or "peer development" (Shiner, 1999). Peer delivery is more concerned with the use of peer educators to deliver formal sessions. Evaluations of these programs may consider the degree to which the programs had an impact on the target population. Peer development, however, is more concerned with the personal growth of the peer educators themselves. Measures of success for these programs may want to reveal the extent to which peer educators improved in terms of self-efficacy or self-esteem. In actuality, many peer programs will combine elements of both approaches. Another consideration is the type of incentives, if any, offered to the peer educators. Incentives may include course credit, volunteer service hours, participation in special activities, attainment of new skills and work experiences, and others. Such incentives may be useful in retaining peer educators and sustaining the program (Norman, 1998).

- *Ensure program goals are consistent with the setting or location of the program.* Different settings may be appropriate for reaching different populations. Shiner (1999), for example, suggests that school-based programs

are an efficient way to reach large populations of adolescents. These settings are well suited to providing prevention-focused knowledge and skills to general populations. When the goal is to reach those adolescents who are most at risk, however, community-based organizations that serve particular populations, such as gay youth or minority groups, might provide a better opportunity for reaching those adolescents.

- *Provide the necessary resources.* Walker & Avis (1999) suggest that peer programs may be unsuccessful in achieving desired outcomes if they fail to provide appropriate resources, such as funding, training, personnel, and institutional support. Some planners propose that peer-based programs will be more cost-effective than other strategies since they do not rely solely on professional teachers or counselors. At the same time, others warn that using peer educators is a complex process. It requires adequate training for the peer educators and for their adult supervisors — both groups will need instruction in the content area, but also in teaching, facilitation, communication and/or counseling skills and techniques.

- *Ensure that the person who coordinates the program understands the value of peer programs and is committed to working with youth.* Peer-based interventions require involvement from adults for supervision, quality assurance, coordination, guidance and other types of support. Project coordinators should understand the nature of working with adolescents. They should also be committed to the goals of the project and appreciate the contributions peer educators can add (Norman, 1998).

- *Prepare for peer educator and staff turnover.* Peer educators may have high turnover rates due to schedule conflicts, other academic and or extra-curricular activities, or graduation from school. Adult coordinators will most likely have a number of other responsibilities. Planners should include mechanisms for recruiting and training new peer educators and personnel throughout each phase of the program.

- *Plan for evaluation in the time line and budget.* As this review has pointed out, rigorously evaluated peer programs are lacking. Evaluations are needed to assess both the effectiveness and cost-effectiveness of peer programs programs. Because evaluation is such an integral part of program design, evaluation plans should be defined at the very beginning of program conceptualization and necessary resources should be set aside.

Recommendations for Conducting Evaluations of Peer Programs

Effective evaluations can take on many forms, depending on what one wants to evaluate, practical logistics, and program resources. Deciding on data collection options and strategies for an evaluation depends on answers to several questions (Patton, 1987):

(1) *Who* is the information for and *who* will use the findings of the evaluation?

(2) *What* type of information is needed?

(3) *How* is the information to be used? For what purposes is the evaluation being done?

(4) *When* is the information needed?

(5) *What* resources are available to conduct the evaluation?

In general, evaluations should be built into the design of the program and should start with the program's definition of its aims and objectives. The design of evaluations always involves trade-offs. On the one hand, evaluations should be designed with sufficient rigor so fairly accurate conclusions can be reached. On the other hand, practical issues of time, money, cooperation, and ethics must be weighed, often limiting design options (Rossi et al., 1999).

Many programs take for granted the process elements of peer programs. Understanding these processes can provide important information about program performance to program managers and other stakeholders, lead to more effective implementation, and provide context and meaning to evaluation outcome findings (Milburn, 1995; Rossi et al., 1999). Process evaluations can be conducted either through qualitative or quantitative data collection methods, or both. Qualitative methods allow one to study selected issues, cases, or events in detail. Quantitative methods

permit one to take measurements from a large number of people, thus facilitating comparison among groups, establishing cause and effect relationships, and generalizing the findings to larger groups of people (Patton, 1987). Qualitative methods could involve: (1) in-depth, open-ended interviews (e.g., interviews with key informants in schools to find out about the effectiveness of program operations, how well the program is organized, the quality of its services, or the success with which it is reaching the target population); (2) direct observation (e.g., in evaluating violence prevention programs one could review direct incidences of assault); and (3) review of written documents, including open-ended written items on questionnaires, program records (e.g., in evaluating violence prevention programs one could review discipline referrals to principals). Quantitative methods are described below.

Impact/outcome evaluations are generally conducted through quantitative methods alone, or quantitative combined with qualitative methods. Though impact assessments can certainly be conducted qualitatively and yield important information, estimating net effects is best achieved by collecting data that are quantifiable and systematically and uniformly collected (Rossi et al., 1999). Quantitative studies ideally should be designed so that they can best establish cause-effect relationships and rule out any rival explanations for why a peer program may or may not work. Evaluations, for example, that include a pre-test and a post-test after the intervention, but no control group (i.e. a group of students that did not receive the intervention) do not permit one to rule out several rival explanations for program effects. These rival explanations include: "maturation" (e.g., developmental changes in the adolescent caused the changes in outcomes, not the program itself), "testing" (e.g., the first 'pre-test' may have sensitized the adolescents studied and could have led to higher scores on the 'post-test'), and "history" (i.e., if the post-test was given after a considerable amount of time, the difference between it and the pretest may be due to outside influences rather than the program itself) (Kidder and Judd, 1986). Designs that include a comparison group, or provide additional observations across time for a single group solve many of these problems. Ideally, therefore, if time and resources allow, quantitative evaluations should have a pre-test/post-test control group design with follow-up (include pre-test information about the existing group base-line levels, provide a comparison group, and allow one to evaluate the impact of the peer intervention results over time) or a time-series design, where to examine the trends in the data, one takes several measurements before the intervention, at the time of intervention, and several times after the intervention.

In addition, the following should be taken into consideration in conducting quantitative evaluations:

- *Effective evaluations attempt to ensure the generalizability of findings as much as possible.* Studies should be conducted among student populations of diverse ethnic composition and socio-economic status. In addition, a sampling strategy should attempt to select an unbiased sample of the population of interest.

- *Effective evaluations should have large enough sample sizes to provide sufficient statistical power.* Small sample sizes limit one's ability to make accurate assessments about the study's outcomes. Sample sizes should be calculated based on formulas that take into account the type of study design, the major study variables, the tolerable range of error, the expected response rate, and the effect size.

- *To strengthen program evaluation across program sites, comparable process and outcome indicators are needed.* If possible, outcome measures should be used that have been found to be reliable and valid in other studies and that are comparable across studies.

- *Ideally, evaluation indicators should not be limited to knowledge and behavioral outcomes but should also include psychosocial and process-related determinants of behaviors.* All indicators should be based on the theoretical approaches demonstrated to be effective in influencing health-related risk behaviors.

- *Effective evaluations should limit the potential for response bias.* To minimize the effect of response bias, care needs to be taken to assure respondents before administering the questionnaire that their responses are anonymous and confidential. In addition, because response inconsistencies may also be due to confusion about the question and its terminology rather than dishonesty in reporting (Alexander et al., 1993), the survey instrument should be pre-tested (on a small group of adolescents similar to the study population, but not included in the actual study) to ensure that respondents understand the questions. Additionally, for substance abuse programs (if resources allow), the validity of self-reported data can be increased through collecting saliva tests as was done by some authors, including Botvin and colleagues (1990) and Ellickson and colleagues (1993).

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Appendix A: List of Outcome Studies

Table 1: Selected studies of the prevention-related outcomes of peer programs for adolescents

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Botvin et al., 1990	Tobacco, marijuana, and alcohol use prevention	998 8th grade students from New York Predominantly white, middle class	Random assignment of 10 schools to: - peer-led - teacher-led - peer-led with booster session - teacher-led with booster session - control Data collection: - Pre-test/post-test in 7th grade - 8th grade follow-up post-booster session	Theory-based, multi-component substance abuse prevention curriculum 7th grade: 20 sessions 8th grade: 10 sessions	- cigarette use - alcohol use - marijuana use - knowledge - attitudes - assertiveness - locus of control - social anxiety - self-esteem - self-confidence/ self-satisfaction - general influenceability	Peer-led booster intervention: less overall smoking; less alcohol use, less marijuana use than control. Was generally superior to other three intervention conditions. Peer-led booster intervention more effective than teacher-led interventions on : smoking knowledge; drinking knowledge; marijuana knowledge; smoking attitudes; locus of control	Booster condition superior to non-booster condition; Teachers failed to implement program according to protocol

Botvin, G.J., Baker, E., Filazolla, A.D., & Botvin, E.M. (1990). A cognitive-behavioral approach to substance abuse prevention: One-year follow-up. *Addictive Behaviors, 15,* 47-63.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Clarke et al., 1986	Smoking prevention	1321 7th grade students from Vermont	Random assignment of 10 schools to: - peer-led - teacher-led - expert-led - control Data collection: - Baseline - 8th grade follow-up - 1 and 6-month after 8th grade booster session - 9th grade 2 month follow-up post Spring booster session	Multi-component smoking prevention program 4 days/ 1 hour each day.	- cigarette use - smoking intention - locus of control	Among females: - Rate of daily smoking onset significantly less among teacher-led than control students - Behavioral intention to smoke significantly less for both teacher-led and peer-led approaches, compared to controls Among males: - no statistically significant differences with respect to smoking onset or intention among treatment conditions	Females responded to teacher-led approach. Males responded better to peer-led approach, although results not significant

Clarke, J.H., MacPherson, B., Holmes, D.R., & Jones, R. (1986). Reducing adolescent smoking: A comparison of peer-led, teacher-led, and expert interventions. *Journal of School Health, 56*, 102-106.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Dunn et al, 1998	HIV/AIDS prevention	160 9th grade students in Ontario, Canada Diverse ethnic backgrounds	Random assignment of classes in one school to: - nurse-led program - peer-led program Non-random assignment of classes to control group Data collection: - immediately post-intervention	HIV/AIDS prevention curriculum composed of factual information, and interactive games emphasizing building self-efficacy and negotiation skills Two 1-hour sessions	- knowledge about HIV/AIDS - HIV/AIDS prevention attitudes - HIV/AIDS self-efficacy - behavioral intentions	Peer-led and nurse-led groups: significantly higher HIV/AIDS prevention knowledge scores than control group Peer-led group: significantly higher attitude, self-efficacy, and behavioral intention scores than control group	Small sample size, post-test only immediately after intervention

Dunn, L., Ross, B., Caines, T., & Howorth, P. (1998). A school-based HIV/AIDS prevention education program: Outcomes of peer-led versus community health nurse-led interventions. *Canadian Journal of Human Sexuality, 7*(4), 339-345.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Ellickson and Bell, 1990 Ellickson, Bell, and Harrison, 1993	Tobacco, marijuana, and alcohol use prevention	3852 7th grade students in California and Oregon Different racial, ethnic, and SES groups	Random assignment of 30 schools to: - health educator-led - teen leaders assisting adult teachers - control group Data collection: - baseline - 3 month follow-up - before and after 12 month booster session - before and after 15 month booster session	- theory-based - participatory group exercises - role-modeling - skills practice 8 session curriculum plus three booster sessions	- alcohol use - cigarette use - marijuana use	Among baseline non-users, treatment groups more effective than control groups in reducing initiation and current use of cigarettes and marijuana. Effect of adult-led and peer-led interventions similar Among baseline smokers, teen-leader program increased smoking Teen-leader program effective in reducing alcohol use only at 3-month follow-up Significant positive impact on reducing cognitive variables hypothesized to affect marijuana and cigarette use. Limited impact on beliefs about alcohol.	

Ellickson, P.L., & Bell, R.M. (1990). Drug prevention in junior high: A multi-site longitudinal test. *Science, 247*, 1299-1305.

Ellickson, P.L., Bell, R.M., & Harrison, E.R. (1993). Changing adolescent propensities to use drugs: Results from Project ALERT. *Health Education Quarterly, 20*, 227-242.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Jemmott, Jemmott, and Fong, 1998	HIV/AIDS Prevention	659 6th and 7th grade students in Philadelphia low income, African-American	Random assignment of students to: - abstinence intervention, adult-led - abstinence intervention, peer-led - safer-sex intervention adult-led - safer-sex intervention peer-led - control intervention, adult-led - control intervention, peer-led Data collection: - immediately before intervention - immediately after intervention - 3-, 6-, and 12-month follow-ups	- theory-based - group discussion - videos - games - brainstorming - experiential exercises - skill-building 8 – 1 hour modules, divided over 2 Saturdays	- sexual intercourse - condom use - condom-use beliefs - intention to use condoms - condom use knowledge - abstinence prevention beliefs - goal attainment beliefs - intention to have sex - attitudes toward sex - HIV risk-reduction knowledge - How much intervention was liked - How much facilitators were liked - How much participants thought they learned from facilitators	No difference in intervention effects between adult-led and peer-led Abstinence intervention significantly increased self-reported abstinence in 3 month follow-up Safer sex intervention significantly increased knowledge, attitudes, beliefs, and self-efficacy immediately after intervention	Results did not differ by gender or facilitator

Jemmott, J.B., III, Jemmott, L.S., & Fong, G.T. (1998). Abstinence and safer sex HIV risk-reduction interventions for African American adolescents: A randomized controlled trial. *JAMA: Journal of the American Medical Association, 279*, 1529-1536.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Kirby et al., 1997	HIV/AIDS/ pregnancy prevention	1,657 7th grade students in Los Angeles Latino, Asian, African American, non-Latino whites	Random assignment of 102 classrooms from 6 schools to: - peer-taught group - control group Data collection: - before implementation - 5- and 17-month follow-up	Theory-based multi-component HIV/AIDS and pregnancy prevention curriculum 8 sessions over 2 week period	- sexual intercourse - number of sexual partners - condom use - contraception use - Pregnancy and HIV-risk related knowledge, beliefs, attitudes, self-efficacy	No significant differences between treatment and control groups in the proportions of students who initiated sex, the numbers of times they had sex, the number of sexual partners, or use of condoms or birth control Increase in knowledge about HIV- and pregnancy-related topics. No significant effect on attitudinal or belief outcomes	

Kirby, D, Korpi, M., Adivi, C., & Weissman, J. (1997). An impact evaluation of Project SNAPP: An AIDS and pregnancy prevention middle school program. *AIDS Education and Prevention, 9*(supplement A), 44-61.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Luepker et al., 1983	Smoking prevention	1081 7th grade students in Minnesota predominantly white; different socio-economic levels	Non-random assignment of 3 schools to: - adult-led - peer-led - control Data collection: - Baseline - end of 7th, 8th, and 9th grades	Skill-training and videotapes (no information on length or number of sessions)	- general health knowledge - attitudes toward smoking - smoking behavior of parents, siblings, and friends - self-declared smoking status - cigarette use	Peer-taught program lower incidence of smoking and fewer cigarettes consumed after 9th grade when compared to other groups. Adult-taught program smoking rates were initially lower, but after second year follow-up were similar to those in the control group	Original design included 4 schools but one of the control schools not reported on because of data collection differences; School with adult-led program closed during year 3 of study. Students reassigned to other schools and assessed there.

Luepker, R.V., Johnson, C.A., Murray, D.M., & Pechacek, T.F. (1983). Prevention of cigarette smoking: three-year follow-up of an education program for youth. *Journal of Behavioral Medicine, 6*(1), 53-62.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Murray et al., 1988, 1989	Smoking prevention	6,135 7th grade students in Minnesota mostly white population from different socioeconomic levels	Random assignment of 4 schools to: - peer leaders working with teacher facilitators - peer leaders working with teacher facilitators and a video - teacher facilitators - teacher facilitators with a video - control group Data collection: - Baseline - annual follow-ups	- theory-based - teaching - skill-building (no information on length or number of sessions)	- cigarette use	Peer-led program more effective than other programs in reducing onset of smoking among non-smokers No differences seen in year 5-6 (12th grade and one year later)	Follow-up survey procedures were not uniform for all subjects

Murray, D.M., Davis-Hearn, M., Goldman, A.I., Pirie, P., & Luepker, R.V. (1988). Four- and five-year follow-up results from four seventh-grade smoking prevention strategies. *Journal of Behavioral Medicine, 11*, 395-405.

Murray, D.M., Pirie, P., Luepker, R.V., & Pallonen, U. (1989). Five- and six-year follow-up results from four seventh-grade smoking prevention strategies. *Journal of Behavioral Medicine, 12*, 207-218.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Orpinas et al., 1995	Violence prevention	223 6th grade students in Texas	Non-random assignment of students in 4 schools to: - teacher-led curriculum - teacher-led, assisted by peer-led curriculum - control group Data collection: - 1-week and 3-month follow-up post-intervention	Included: - knowledge - role-plays - problem-solving - skill-building 15 50-minute lessons.	- self-reported aggressive behavior - violence prevention knowledge, skills, attitudes, and self-efficacy	Reductions in self-reported aggressive behavior among boys in intervention groups compared to control groups. Increases in knowledge and skills among boys and girls of intervention groups compared to control groups Stronger changes in attitude toward responding violently when provoked in teacher plus peer leader group than other intervention groups. No intervention effect on self-efficacy, or attitudes toward skills to reduce violence. Intervention effects did not hold over time.	

Orpinas, P., Parcel, G.S., McAlister, A., & Frankowski, R. (1995). Violence prevention in middle schools: A pilot evaluation. *Journal of Adolescent Health, 17*, 360-371.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Prince, 1995	Smoking prevention	93 students in 7 high schools in LA and Ventura counties	Non-random assignment to: - peer-led - adult-led - control Data collection: - pre-test - post-test - one-month follow-up	6 session program (no information on intervention method)	- cigarette use - student's dominant reason for smoking - smoking self-efficacy	No difference in peer-led vs. adult-led groups. Both peer-led and adult-led groups showed significant reduction in the number of cigarettes smoked daily between pre- and post 1 measures and pre and post-2 measures when compared to the control group. No significant differences in self-efficacy scores between adult-led and peer-led groups.	

Prince, F. (1995). The relative effectiveness of a peer-led and adult-led smoking intervention program. *Adolescence, 30*(117), 187-194.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Rickert et al., 1991	HIV/AIDS prevention	82 12-18 year olds from community and church organizations Low to upper middle-class	Random assignment to: - peer-led - adult-led - control Data collection: - immediately post-intervention	- lecture format - video (Length of time not specified)	- knowledge about HIV/AIDS - attitudes toward persons with AIDS - attitudes toward practicing personal preventive behaviors - beliefs about the seriousness of AIDS - satisfaction with the intervention	Peer- and adult-led: -significant increase in knowledge and attitudes when compared to controls	Immediate post-intervention assessment only

Rickert, V., Jay, S., Gottlieb, A. (1991). Effects of a peer-counseled AIDS education program on knowledge, attitudes, and satisfaction of adolescents. *Journal of Adolescent Health, 12,* 38-43.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Sellers et al., 1994	Prevention of risky sexual behaviors	586 primarily Puerto Rican adolescents (ages 14-20) in Boston	Longitudinal comparison of probability samples from intervention city and comparison city (Hartford, Conn.)	18-month community-based AIDS prevention program conducted by peer leaders. Included: - workshops in schools, community organizations, and health centers group discussions in the homes of youth -presentations at large community events -door-to-door and street corner canvassing, including distribution of condoms and pamphlets	- onset of sexual activity - frequency of multiple partners - frequency of sex	Male respondents less likely to initiate first sexual activity post-intervention Female respondents less likely to have multiple partners post-intervention No significant effect on onset of sexual activity for females, chances of multiple partners for males, or frequency of sex for either males of females.	

Sellers, D. E., McGraw, S. A., McKinlay, J. B. (1994). Does the promotion and distribution of condoms increase teen sexual activity? Evidence from an HIV prevention program for Latino youth. *American Journal of Public Health, 84* (12), 1952-1958.

Appendix B: List of Additional Outcome Studies

Table 2: Selected studies of the outcomes of peer mediation programs and effects of peer programs on peer educators/mediators

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Bell et al. (2000)	Peer Mediation	- 30 peer mediators from a rural low-SES elementary school in Tennessee serving 6th-8th grade students - 25 teachers	Purposive selection of peer mediators and teachers Data Collection: - Pre-test/post-test of peer mediators before and immediately after training, plus a 6-week follow-up - Teacher survey before training and 12 weeks after training - Trend data generated by school staff relating to suspensions/ discipline problems - Peer mediator discipline referrals compared to a random sample of 30 non-peer mediators	Peer mediation training which occurred over a 2-month period; training involved didactic presentations, homework assignments, discussions of actual mediations and role-plays Continued daily mediation time blocks for an unidentified period of time post-intervention	- Mediation skills retention - Peer mediation outcomes - Teacher reports of classroom behavior - School-wide suspensions from previous 3 years and the intervention year - Peer mediator behavioral marker	Peer mediators, at both post-test and 6-week follow-up, indicated they would implement more of the steps of mediation than they had noted at pre-test By 6-week follow-up 34 mediations had been conducted, resulting in 32 resolutions (94%) and 2 referrals to the principal (6%) Teachers reported reductions in in-class fights at 12-week follow-up Largest reductions in suspensions were found in the intervention year	No control group to measure impact of peer mediation vs. other interventions or no intervention

Bell, S.K., Coleman, J.K., Anderson, A., Whelan, J.P., & Wilder, C. (2000). The effectiveness of peer mediation in a low-SES rural elementary school. *Psychology in the Schools, 37*, 505-516.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Birnbaum et al. (In press)	Nutrition	3,878 7th graders from school district in Minneapolis and St. Paul, Minnesota	Group-randomized trial design of 16 schools; half randomly assigned as controls and the others randomly assigned to one of the following: - school environment intervention; - school environment plus classroom instruction - peer leader plus school environment plus classroom instruction Data Collection: - Pre-test/Post-test	Year-long intervention. School environment interventions included displays, prizes and greater availability of healthy foods in school Classroom instruction involved 10 behaviorally-based sessions Peer leaders received a full day of training and helped teachers deliver the classroom intervention 6 of 8 intervention schools formed a School Nutrition Advisory Council	- Fruit and vegetable intake - Usual food choices - Psychosocial mediators of eating behavior	Peer leaders reported the greatest increases in fruit and vegetable intake and the selection of lower-fat foods To a lesser degree, students in the school environment plus classroom instruction intervention reported increased fruit and vegetable intake and selection of lower-fat foods No significant changes in fruit and vegetable intake for the school environment only and control groups; the school environment only group did show a positive trend toward the selection of lower-fat foods There were no between-group or within group differences in psychosocial mediators from pre-test to post-test	No follow-up to date

Birnbaum, A.S., Lytle, L.A., Story, M., Perry, C.L., & Murray, D.M. (In press). Are differences in exposure to a multicomponent school-based intervention associated with varying dietary outcomes in adolescents? *Health Education & Behavior*.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Crary (1992)	Peer Mediation	Students and staff from an urban middle school in California: - 203 student disputants - 53 peer mediators - 125 students from the student body at-large - 23 faculty and staff members	Non-random selection of disputants; purposive selection of peer mediators; random selection of students by homeroom for the student-at-large survey; inclusion of all faculty and staff members for the staff survey Data Collection: - Pre-/post-test of peer mediators before and after training - Post-intervention and end-of-year follow-up with student disputants - Pre-/post-test of student body - Pre-/post-test of faculty and staff	Year-long peer mediation program. 27 peer mediators were trained in the fall and 26 were trained in the spring. Student disputants were referred to mediation by teachers and administrators or by themselves.	- Peer mediation outcomes - Student disputant satisfaction and compliance with mediation - Self-esteem of peer mediators - Student body perception of school climate - Staff perception of school climate	96 cases, involving 203 students were referred to peer mediation; 95 cases agreed to mediation with 97% resulting in resolutions Most student disputants felt that mediation was fair and effective. Most also reported at the end-of-year follow-up that they complied with the resolution Peer mediators showed a trend toward greater self-esteem after training. No overall significant differences in the student body's perception of school climate Faculty and staff did perceive improvements in school climate during the intervention year	No control group to measure impact of peer mediation vs. other interventions or no intervention No follow-up with peer mediators

Crary, D.R. (1992). Community benefits from mediation: A test of the "peace virus" hypothesis. *Mediation Quarterly, 9*, 241-252.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Haignere et al. (1997)	HIV/AIDS	35 peer educators recruited from New York middle and high schools	Purposive selection of peer educators Data Collection: - Surveys before each training cycle plus a 4- to 6-month follow-up	36-hour 9-10 week training	- HIV/AIDS knowledge and belief - Self-esteem - Peer pressure - Outreach activities	Significant increases in peer educator knowledge, self-efficacy, resistance to peer pressure, discussions with friends, and discussions with person other than friends and relatives Also gave significantly more presentations, distributed condoms to more people and spoke up more when others said something negative about persons living with HIV/AIDS	

Haignere, C.S., Freudenberg, N., Silver, D.R., Maslanka, H., & Kelley, J.T. (1997). One method for assessing HIV/AIDS peer-education programs. *Journal of Adolescent Health, 21*, 76-79.

Study	Topic Area	Sample	Study Design	Intervention Method	Measures	Outcome Results	Comments
Tolson et al. (1992)	Peer mediation	Students from a suburban high school: - 14 peer educators - 52 student disputants	Student disputants randomly assigned to either peer mediation (n=28) or traditional mediation (n=24), which involved meeting with the associate dean and receiving warnings, suspensions or demerits Referrals of student disputants were tracked for 49 days after the mediation or traditional discipline Data Collection: - One-week follow-up with disputants sent to peer mediation assessed satisfaction with the mediation process	14 students, recommended by deans and counselors, were trained as peer mediators. Peer mediators were trained in a 5½ hour session and then had follow-up meetings to monitor progress, and update skills. Two peer mediators conducted each mediation, with at least one mediator being the same gender and at least one being the same sex as the disputants.	- Referrals for interpersonal and other disciplinary problems after mediation or traditional discipline - Disputant satisfaction with the mediation	Mediation reduced the number of referrals for interpersonal problems, but did not change referrals for other problems. Most disputants believed the mediation process was fair and useful. Most also gave peer mediators high satisfaction ratings for skill in mediation.	

Tolson, E.R., McDonald, S., & Moriarity, A.R. (1992). Peer mediation among high school students: A test of effectiveness. *Social Work in Education, 14*(2), 86-93.